



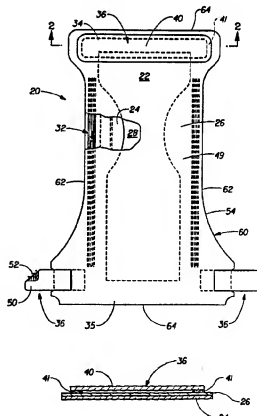
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US95/03077 (22) International Filing Date: 9 March 1995 (09.03.95) (30) Priority Data: 08/217,405 - 24 March 1994 (24.03.94) US (71) Applicant: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US). (72) Inventors: KLINE, Mark, James; 5265 Ponderosa Drive, Cincinnati, OH 45239 (US). THOMAS, Dennis, Albert; 11634 Mountholly Court, Cincinnati, OH 45240 (US). (74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217 (US).			(81) Designated States: AM, AU, BB, BG, BR, BY, CA, CN, CZ, FI, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LV, MD, MG, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, TJ, TT, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).  <b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>

## (54) Title: ABSORBENT ARTICLE HAVING AN IMPROVED MECHANICAL FASTENING SYSTEM

## (57) Abstract

An absorbent article (20) having an improved fastening system. The fastening system includes a securement member (50) disposed in the rear waist portion of the absorbent article (10) and at least one landing member (40) disposed in the front waist portion of the absorbent article (20). The securement member (50) preferably includes a plurality of hooks (52). The landing member (40) preferably includes a plurality of loops which are engageable with the hooks (52) of the securement member (50). The landing member (40) is secured about its periphery along peripheral seal lines to the backsheet (26) in the front waist portion of the absorbent article (20). Upon separation of the securement member (50) from the landing member (40), the portion of the landing member (40) within the peripheral seal lines lifts and separates from the backsheet, (26) thereby increasing the peel strength of the fastening system.



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## ABSORBENT ARTICLE HAVING AN IMPROVED MECHANICAL FASTENING SYSTEM

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### FIELD OF THE INVENTION

The present invention relates to absorbent articles such as diapers, incontinent briefs, diaper holders, and the like, and more particularly, the present invention relates to absorbent articles having an improved mechanical fastening system.

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### BACKGROUND OF THE INVENTION

Infants and other incontinent individuals wear absorbent articles such as diapers to receive and contain urine and other body exudates. Absorbent articles function both to contain the discharged materials and to isolate these materials from the body of the wearer and from the wearer's garments and bed clothing. Disposable absorbent articles having many different basic designs are known in the art. For example, U.S. Pat. No. Re. 26,152 issued to Duncan et al. on January 31, 1967, describes a disposable diaper which has achieved wide acceptance and commercial success. U.S. Pat. No. 3,860,003 issued to Buell on January 14, 1975 describes an elasticized leg cuff disposable diaper which has achieved wide acceptance and commercial success.

Absorbent articles such as diapers generally include some type of fastening system or securement system for fitting the diaper or absorbent article to the wearer. Mechanical fastening systems, such as hook and loop systems have been used on absorbent articles in the past. However, various limitations have prevented the widespread commercialization of these systems on disposable absorbent articles. Limitations to the commercialization of mechanical fastening systems on disposable absorbent articles include the cost of the system and the functionality of that system. Typically, the cost and functionality of the system is a trade-off. In other words, greater functionality and performance can be achieved by using more expensive material.

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Generally, hook and loop systems fail in the "peel" mode. For example, a peel

mode exists when one component is held stationary, while the other component is pulled off the first component sequentially. When the two attaching components, such as a plurality of hooks and a plurality of loops are disengaged in the peel mode, the hooks and loops are progressively separated. That is, each row or line of hooks is disengaged a little at a time until all of the hooks are disengaged from the respective loops. The peel performance of hook and loop systems is very sensitive to the cost/performance ratio. Generally, to obtain higher peel, a higher basis weight loop must be used which ultimately translates to more loops, thicker fabric, and greater overall cost.

Thus, it would be advantageous to provide a disposable absorbent article with a mechanical fastening system, such as a hook and loop system, having improved peel mode performance.

Therefore, it is an object of the present invention to improve the peel mode performance of mechanical fastening systems, such as hook and loop systems on disposable absorbent articles.

#### SUMMARY OF THE INVENTION

The present invention provides absorbent articles such as disposable diapers, incontinent briefs, diaper holders and the like that have a unique fastening system. Such absorbent articles have longitudinal edges, end edges, a front waist portion, a rear waist portion, an outer surface, and an inner surface. The absorbent articles comprise a containment assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined to the topsheet, and an absorbent core positioned between the topsheet and the backsheet. The absorbent core has side edges and waist edges. The absorbent article includes a fastening system having a securement member disposed adjacent each of the longitudinal edges in the rear waist portion and at least one landing member disposed in the front waist portion. The securement member includes a plurality of hooks and the landing member includes a plurality of loops which are engageable with the hooks of the securement member. The landing member is secured to the backsheet in the front waist portion about its periphery along peripheral seal lines. The landing member may include a plurality of slits. The landing member may be secured to the backsheet by an adhesive, sonic bonding or by heat sealing.

The portion of the backsheet adjacent the landing member is preferably unattached to the immediately adjacent layer, such as the absorbent core.

The landing member is preferably a woven or nonwoven web. The hooks of

the securement members may be oriented in a single direction or in a multiplicity of directions.

### BRIEF DESCRIPTION OF THE DRAWINGS

5 While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as forming the present invention, it is believed that the invention will be better understood from the following description which is taken in conjunction with the accompanying drawings in which like designations are used to designate substantially identical elements, and in which:

10 FIG. 1 is a plan view of a disposable diaper embodiment of the present invention having portions cut-away to reveal the underlying structure, the outer surface of the diaper facing the viewer;

FIG. 2 is a fragmentary sectional view of the disposable diaper shown in FIG. 1 taken along section line 2-2 of FIG. 1;

15 FIG. 3 is a graph comparing the peel strength of a conventional hook and loop system with a hook and loop system of the present invention, the graph is a spline fit of ten samples of both the conventional hook and loop system and the hook and loop system of the present invention; and

20 FIG. 4 is a fragmentary plan view of an alternative disposable diaper embodiment of the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

As used herein, the term "absorbent article" refers to devices which absorb and contain body exudates, and, more specifically, refers to devices which are placed  
25 against or in proximity to the body of the wearer to absorb and contain the various exudates discharged from the body. The term "disposable" is used herein to describe absorbent articles which are not intended to be laundered or otherwise restored or reused as an absorbent article (i.e., they are intended to be discarded after a single use and, preferably, to be recycled, composted or otherwise disposed of in an environmentally compatible manner). A "unitary" absorbent article refers to absorbent  
30 articles which are formed of separate parts united together to form a coordinated entity so that they do not require separate manipulative parts like a separate holder and liner. A preferred embodiment of an absorbent article of the present invention is the unitary disposable absorbent article, diaper 20, shown in FIG. 1. As used herein, the  
35 term "diaper" refers to an absorbent article generally worn by infants and incontinent persons that is worn about the lower torso of the wearer. It should be understood,

however, that the present invention is also applicable to other absorbent articles such as incontinent briefs, incontinent undergarments, diaper holders and liners, feminine hygiene garments, and the like.

FIG. 1 is a plan view of the diaper 20 of the present invention in its flat-out, uncontracted state (i.e., with elastic induced contraction pulled out) with portions of the structure being cut-away to more clearly show the construction of the diaper 20 and with the portion of the diaper 20 which faces away from the wearer, the outer surface, oriented towards the viewer. As shown in FIG. 1, the diaper 20 preferably comprises a liquid pervious topsheet 24; a liquid impervious backsheet 26 joined with the topsheet 24; an absorbent core 28 positioned between the topsheet 24 and the backsheet 26; elasticized leg cuffs 32; a front waist portion 34; a rear waist portion 35; and a fastening system generally multiply designated as 36. The diaper 20 is shown in FIG. 1 to have an outer surface 49, an inner surface 54 opposed to the outer surface 49, and a periphery 60 which is defined by the outer edges of the diaper 20 in which the longitudinal edges are designated 62 and the end edges are designated 64. The inner surface 54 of the diaper 20 comprises that portion of the diaper 20 which is positioned adjacent to the wearer's body during use (i.e., the inner surface 54 generally is formed by at least a portion of the topsheet 24 and other components joined to the topsheet 24). The outer surface 49 comprises that portion of the diaper 20 which is positioned away from the wearer's body (i.e., the outer surface 49 generally is formed by at least a portion of the backsheet 26 and other components joined to the backsheet 26).

FIG. 1 shows a preferred embodiment of the diaper 20 in which the topsheet 24 and the backsheet 26 have length and width dimensions generally larger than those of the absorbent core 28. The topsheet 24 and the backsheet 26 extend beyond the edges of the absorbent core 28 to thereby form the periphery 60 of the diaper 20. While the topsheet 24, the backsheet 26, and the absorbent core 28 may be assembled in a variety of well known configurations, preferred diaper configurations are described generally in U.S. Pat. No. 3,860,003 issued to Kenneth B. Buell on January 14, 1975; U.S. Pat. No. 5,151,092 issued to Kenneth B. Buell et al. on September 29, 1992; and U.S. Pat. No. 5,196,000 issued to Clear et al. on March 23, 1993. Each of these patents are hereby incorporated herein by reference.

FIG. 2 is a cross-sectional view of the diaper 20 taken along section line 2-2 of FIG. 1 in the first waist portion 34. FIG. 2 shows the construction of the fastening system 36 in the front waist portion 34. Fastening system 36 in front waist portion 34 includes a landing member 40 secured to the backsheet 26 so as to form a portion of

the outer surface 52. Landing member 40 can be a woven or nonwoven fabric material manufactured to have a raised loop construction in which the fabric is stabilized, i.e., the individual loops are erect from the fabric's base. Landing member 40 can also be any suitable material having nonwoven loops thereon. A suitable landing member is a woven material manufactured by Guilford Mills of New York, NY and marketed as Guilford Loop 18904 or Loop 34072. Other suitable landing members are described in U.S. Pat. No. 5,256,231 issued to Gorman et al. on October 26, 1993; and U.S. Pat. No. 5,032,122 issued to Noel et al on July 16, 1991. Each of these patents are incorporated herein by reference. Landing member 40 is secured to the front waist portion 34 of backsheet 26 such that the loops extend outwardly therefrom. The geometric shape of landing member 40 can be any desired shape such as rectangular, irregular, diamond, triangular, circular, oval, chevron, or the like. Landing member 40 shown in FIGS. 1 and 2 is generally rectangular in shape.

The landing member 40 is secured to the backsheet 26 about its periphery along peripheral seal lines 41. Accordingly, the portion of landing member 40 inside peripheral seal lines 41 is unattached to the backsheet 26 and is free to move relative to the backsheet 26. Adhesives which have been found suitable for attaching landing member 40 to backsheet 26 include but are not limited to Findley Hot Melt Adhesives H2031 or H2085 manufactured by Findley Adhesives of Wauwatosa, WI. Landing member 40 may also be attached to backsheet 26 along peripheral seal lines 41 by sonic bonding or heat sealing techniques known in the art.

The peripheral seal lines 41 are shown in FIG. 1 as being continuous about the entire periphery of the landing member 40. However, the seal lines do not have to be continuous and may be discontinuous or interrupted.

The securement system 36 also includes a securement member 50 disposed adjacent each longitudinal edge 62 in the rear waist portion 35. Securement member 50 includes a plurality of hook members 52 for engaging a plurality of the loop members on landing member 40. Hook members 52 can face in a single direction or can be oriented in multiple directions. For example, a set of rows of hook members 52 may face inwardly while another set of rows can have their hook members facing in an opposite direction. Alternatively, individual hook members 52 can be oriented in any different number of directions as desired. Hook members 52 can have any desired geometry or shape, such as hook-shaped, mushroom-shaped, or T-shaped, and can be made of any suitable material, such as nylon or polyester. A preferred hook material is manufactured by The Bostik Company of Middleton, MA, and marketed as Bostik 7199 Polyester Hotmelt. Exemplary hooks and methods for making the same are

described in commonly assigned U.S. Pat. No. 5,058,247 issued to Thomas et al. on October 22, 1991; U.S. Pat. No. 5,116,563 issued to Thomas et al. on May 26, 1992; U.S. Pat. No. 5,180,534 issued to Thomas et al. on January 19, 1993; and U.S. Pat. No. 5,230,851 issued to Thomas on July 27, 1993. Each of these patents are  
5 incorporated herein by reference. The hooks 52 project from and are secured to a substrate of flexible material. A suitable substrate material is a 1.0 mil thick polyester film available from 3M Disposable Products Division, St. Paul, MN.

To fasten the diaper to the wearer, hooks 52 of securement member 50 are secured to the loop of landing member 40 about the waist of the wearer. Hooks 52  
10 engage the loops of landing member 40 to securely fasten the waist portions of the diaper.

Upon separation of hooks 52 from the loops in landing member 40, the portion of landing member 40 which is within the peripheral seal lines 41 and is unattached to  
15 backsheet 26 will lift and separate from backsheet 26 resulting in an increase in the peel strength between hooks 52 and the loops of landing member 40. Referring now to FIG. 3, graph line S illustrates the peel strength of a conventional hook and loop system in which the entire surface of the landing member is secured to its substrate. In contrast, graph line P illustrates the peel strength of a hook and loop system of the  
20 present invention where the landing member is secured to its substrate about its periphery along peripheral seal lines. As can be seen in FIG. 3, the peel strength of the hook and loop system of the present invention, line P, is significantly greater than the peel strength of the conventional hook and loop system, line S. Without being bound to any specific theory or mechanism, it has been found that the increase in peel  
25 strength results from the peripheral attachment of the landing member 40 to the backsheet 26 which allows a portion of the landing member within the peripheral seal to lift and separate from the backsheet 26 upon separation of the securement member 50 from the landing member 40.

FIG. 4 is a fragmentary plan view of an alternative disposable diaper embodiment of the present invention. Disposable diaper 120 includes a landing  
30 member 140 in the front waist portion 134. Landing member 140 is secured to backsheet 126 so as to form a portion of the outer surface of diaper 120. Landing member 140 is secured to backsheet 126 about its periphery along peripheral seal line 141. Landing member 140 includes a plurality of loops which engage hooks 52 of securement member 50 to securely fasten the waist portion of the diaper. Upon  
35 separation of hooks 52 from the loops of landing member 140, the portions of landing member 140 not secured to backsheet 126 will lift and separate from backsheet 126.



Furthermore, the addition of slits 136 in landing member 140 will allow for even greater separation and distortion of landing member 140, thereby increasing the peel strength of the mechanical fastening system.

5 In order to preserve the integrity and appearance of landing member 140 it may be desirable to use an elastomeric adhesive to secure the portions of landing member 140 within peripheral seal lines 141 to the backsheet 126. By using an elastomeric adhesive, the portions of landing member 140 adjacent slits 136 will substantially return to their undeformed condition after separation of the loops of landing member 140 from hooks 52.

10 To further increase the peel strength of the fastening system of the present invention it may be desirable to have the portion of backsheet 26 adjacent the landing member unattached to the immediately adjacent layer, e.g., absorbent core 28. By having the portion of the backsheet adjacent the landing member unattached to the immediately adjacent layer, the backsheet will raise or lift independently from the  
15 landing member which will also raise and lift upon separation of the hooks from the loops of the landing member, thereby further increasing the peel strength of the fastening system.

In another embodiment of the present invention, the portion of the backsheet adjacent the landing member is unattached to the immediately adjacent layer while the  
20 landing member is secured to the backsheet by techniques known in the art. For example, the entire surface or substantially the entire surface of the landing member may be secured to the backsheet. The backsheet and the landing member will raise or lift in unison upon separation of the hooks from the loops of the landing member, thereby increasing the peel strength of the fastening system.

25 The containment assembly 22 of the diaper 20 is shown in FIG. 1 as comprising the main body (chassis) of the diaper 20. The containment assembly 22 comprises at least an absorbent core 28 and preferably an outer covering layer comprising the topsheet 24 and the backsheet 26. When the absorbent article comprises a separate holder and a liner, the containment assembly 22 generally  
30 comprises the holder and the liner (i.e., the containment assembly 22 comprises one or more layers of material to define the holder while the liner comprises an absorbent composite such as a topsheet, a backsheet, and an absorbent core.) For unitary absorbent articles, the containment assembly 22 comprises the main structure of the diaper with other features added to form the composite diaper structure. Thus, the  
35 containment assembly 22 for the diaper 20 generally comprises the topsheet 24, the backsheet 26, and the absorbent core 28.

The absorbent core 28 may be any absorbent means which is generally compressible, conformable, non-irritating to the wearer's skin, and capable of absorbing and retaining liquids such as urine and other certain body exudates. As shown in FIG. 1, the absorbent core 28 has a garment surface, a body surface, side edges, and waist edges. The absorbent core 28 may be manufactured in a wide variety of sizes and shapes (e.g., rectangular, hourglass, "T"-shaped, asymmetric, etc.) and from a wide variety of liquid-absorbent materials commonly used in disposable diapers and other absorbent articles such as comminuted wood pulp which is generally referred to as airlift. Examples of other suitable absorbent materials include creped cellulose wadding; meltblown polymers including coform; chemically stiffened, modified or cross-linked cellulosic fibers; tissue including tissue wraps and tissue laminates; absorbent foams; absorbent sponges; superabsorbent polymers; absorbent gelling materials; or any equivalent material or combinations of materials. The configuration and construction of the absorbent core may also be varied (e.g., the absorbent core may have varying caliper zones, a hydrophilic gradient, a superabsorbent gradient, or lower average density and lower average basis weight acquisition zones; or may comprise one or more layers or structures). The total absorbent capacity of the absorbent core 28 should, however, be compatible with the design loading and the intended use of the diaper 20. Further, the size and absorbent capacity of the absorbent core 28 may be varied to accommodate wearers ranging from infants through adults. Exemplary absorbent structures for use as the absorbent core 28 are described in U.S. Pat. No. 4,610,678 issued to Weisman et al. on September 9, 1986; U.S. Pat. No. 4,673,402 issued to Weisman et al. on June 16, 1987; U.S. Pat. No. 4,888,231 issued to Angstadt on December 19, 1989; and U.S. Pat. No. 4,834,735, issued to Alemany et al. on May 30, 1989. Each of these patents are incorporated herein by reference.

The backsheet 26 is positioned adjacent the garment surface of the absorbent core 28 and is preferably joined thereto by attachment means (not shown) such as those well known in the art. For example, the backsheet 26 may be secured to the absorbent core 28 by a uniform continuous layer of adhesive, a patterned layer of adhesive, or an array of separate lines, spirals, or spots of adhesive. Adhesives which have been found to be satisfactory are manufactured by H. B. Fuller Company of St. Paul, Minnesota and marketed as HL-1258. The attachment means will preferably comprise an open pattern network of filaments of adhesive as is disclosed in U.S. Pat. No. 4,573,986 which issued to Minetola et al. on March 4, 1986, more preferably several lines of adhesive filaments swirled into a spiral pattern such as is illustrated by

the apparatus and methods shown in U.S. Pat. No. 3,911,173 issued to Sprague, Jr. on October 7, 1975; U.S. Pat. No. 4,785,996 issued to Ziecker, et al. on November 22, 1978; and U.S. Pat. No. 4,842,666 issued to Werenicz on June 27, 1989. Each of these patents are incorporated herein by reference. Alternatively, the attachment means may comprise heat bonds, pressure bonds, ultrasonic bonds, dynamic mechanical bonds, or any other suitable attachment means or combinations of these attachment means as are known in the art.

The backsheet 26 is impervious to liquids (e.g., urine) and is preferably manufactured from a thin plastic film, although other flexible liquid impervious materials may also be used. As used herein, the term "flexible" refers to materials which are compliant and will readily conform to the general shape and contours of the human body. The backsheet 26 prevents the exudates absorbed and contained in the absorbent core 28 from wetting articles which contact the diaper 20 such as bedsheets and undergarments. The backsheet 26 may thus comprise a woven or nonwoven material, polymeric films such as thermoplastic films of polyethylene or polypropylene, or composite materials such as a film-coated nonwoven material. Preferably, the backsheet is a thermoplastic film having a thickness of from about 0.012 mm (0.5 mil) to about 0.051 mm (2.0 mils). Particularly preferred materials for the backsheet include RR8220 blown films and RR5475 cast films as manufactured by Tredegar Industries, Inc. of Terre Haute, IN. The backsheet 26 is preferably embossed and/or matte finished to provide a more clothlike appearance. Further, the backsheet 26 may permit vapors to escape from the absorbent core 28 (i.e., breathable) while still preventing exudates from passing through the backsheet 26.

The topsheet 24 is positioned adjacent the body surface of the absorbent core 28 and is preferably joined thereto and to the backsheet 26 by attachment means (not shown) such as those well known in the art. Suitable attachment means are described with respect to joining the backsheet 26 to the absorbent core 28. As used herein, the term "joined" encompasses configurations whereby an element is directly secured to the other element by affixing the element directly to the other element, and configurations whereby the element is indirectly secured to the other element by affixing the element to intermediate member(s) which in turn are affixed to the other element. In a preferred embodiment of the present invention, the topsheet 24 and the backsheet 26 are joined directly to each other in the diaper periphery 60 and are indirectly joined together by directly joining them to the absorbent core 28 by the attachment means (not shown).

The topsheet 24 is compliant, soft feeling, and non-irritating to the wearer's

skin. Further, the topsheet 24 is liquid pervious permitting liquids (e.g., urine) to readily penetrate through its thickness. A suitable topsheet may be manufactured from a wide range of materials, such as porous foams; reticulated foams; apertured plastic films; or woven or nonwoven webs of natural fibers (e.g., wood or cotton fibers), synthetic fibers (e.g., polyester or polypropylene fibers), or a combination of natural and synthetic fibers. Preferably, the topsheet 24 is made of a hydrophobic material to isolate the wearer's skin from liquids contained in the absorbent core 28. There are a number of manufacturing techniques which may be used to manufacture the topsheet 24. For example, the topsheet 24 may be a nonwoven web of fibers spunbonded, carded, wet-laid, meltblown, hydroentangled, combinations of the above, or the like. A preferred topsheet is carded and thermally bonded by means well known to those skilled in the fabrics art. A preferred topsheet comprises a web of staple length polypropylene fibers such as is manufactured by Veratec, Inc., a Division of International Paper Company, of Walpole, Massachusetts under the designation P-8.

The diaper 20 preferably further comprises elasticized leg cuffs 32 for providing improved containment of liquids and other body exudates. Each elasticized leg cuff 32 may comprise several different embodiments for reducing the leakage of body exudates in the leg regions. (The leg cuff can be and is sometimes also referred to as leg bands, side flaps, barrier cuffs, or elastic cuffs.) U.S. Pat. No. 3,860,003 describes a disposable diaper which provides a contractible leg opening having a side flap and one or more elastic members to provide an elasticized leg cuff (gasketing cuff). U.S. Pat. No. 4,909,803 issued to Aziz et al. on March 20, 1990, describes a disposable diaper having "stand-up" elasticized flaps (barrier cuffs) to improve the containment of the leg regions. U.S. Pat. No. 4,695,278 issued to Lawson on September 22, 1987, describes a disposable diaper having dual cuffs including a gasketing cuff and a barrier cuff.

The diaper 20 preferably further comprises an elastic waist feature that provides improved fit and containment. The elastic waist feature is that portion or zone of the diaper 20 which is intended to elastically expand and contract to dynamically fit the wearer's waist. The elastic waist feature at least extends longitudinally outwardly from at least one of the waist edges of the absorbent core 28 and generally forms at least a portion of the end edge 64 of the diaper 20. Disposable diapers are generally constructed so as to have two elastic waist features, one positioned in the front waist portion and one positioned in the rear waist portion, although diapers can be constructed with a single elastic waist feature. Further, while the elastic waist feature or any of its constituent elements can comprise a separate

element affixed to the diaper 20, the elastic waist feature is preferably constructed as an extension of other elements of the diaper such as the backsheet 26 or the topsheet 24, preferably both the backsheet 26 and the topsheet 24. The elastic waist feature may be constructed in a number of different configurations including those described in U.S. Pat. No. 5,151,092 and in U.S. Pat. No. 5,196,000; both of which are  
5 incorporated herein by reference.

The diaper 20 is preferably applied to a wearer by positioning one of the waist portions, preferably the rear waist portion, under the wearer's back and drawing the remainder of the diaper between the wearer's legs so that the other waist portion,  
10 preferably the front waist portion, is positioned across the front of the wearer. The hooks 52 of securement member 50 of fastening system 36 are secured to the loops of landing member 40 of the diaper to effect a side closure.

While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other  
15 changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

WHAT IS CLAIMED IS:

## WHAT IS CLAIMED IS:

1. A disposable absorbent article having longitudinal edges, end edges, a front waist portion, a rear waist portion, an outer surface, and an inner surface, the absorbent article includes a containment assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined to said topsheet, and an absorbent core positioned between said topsheet and said backsheet joined to said topsheet, said absorbent core having side edges and waist edges, said absorbent article characterized by:  
a fastening system including a securement member disposed adjacent each of said longitudinal edges in said rear waist portion and at least one landing member disposed in said front waist portion, said securement member including a plurality of hooks, said landing member including a plurality of loops which are engageable with said hooks of said securement member, said landing member being secured to said backsheet in said front waist portion about its periphery.
2. The absorbent article of Claim 1, wherein said landing member is secured to said backsheet by an adhesive.
3. The absorbent article of Claim 1, wherein said landing member is secured to said backsheet by heat sealing.
4. The absorbent article of any one of the preceding Claims, wherein said backsheet adjacent said landing member is unattached to any immediately adjacent layer.
5. The absorbent article of any one of the preceding Claims, wherein said backsheet adjacent said landing member is unattached to said absorbent core.
6. The absorbent article of any one of the preceding Claims, wherein said landing member includes a plurality of slits.
7. The absorbent article of any one of the preceding Claims, wherein said landing member is a nonwoven web.

8. The absorbent article of any one of the preceding Claims, wherein said landing member is a woven web.
9. The absorbent article of any one of the preceding Claims, wherein said hooks are oriented in a single direction.
10. The absorbent article of any one of the preceding Claims, wherein said hooks are oriented in a multiplicity of directions.

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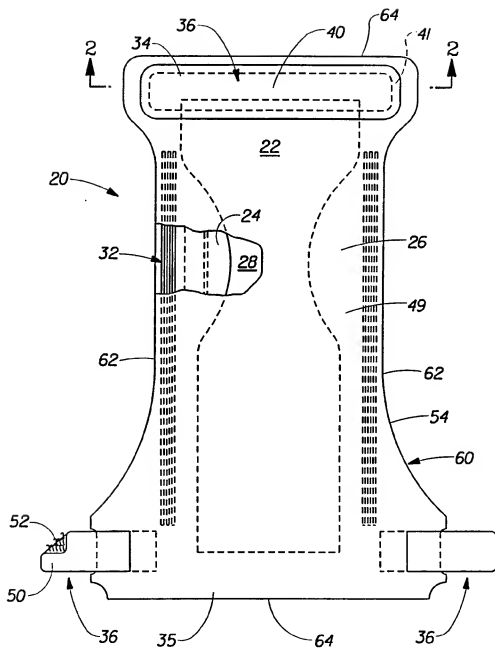


Fig. 1



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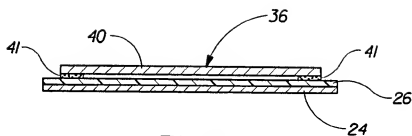


Fig. 2

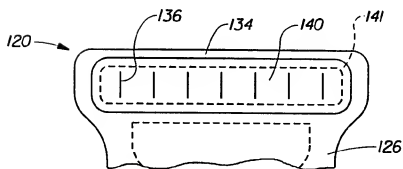


Fig. 4

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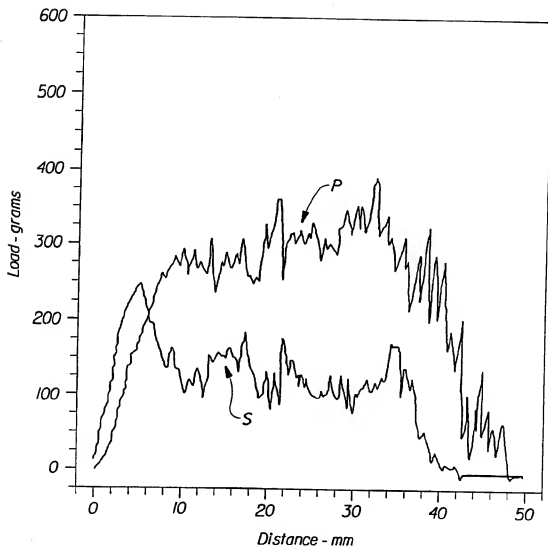


Fig. 3



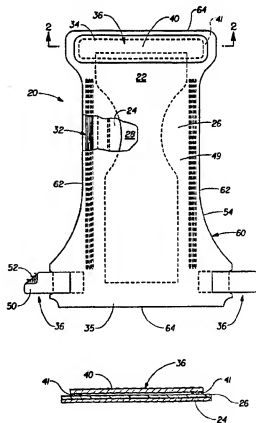
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(71) Applicant: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US).		<b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(72) Inventors: KLINE, Mark, James; 5265 Ponderosa Drive, Cincinnati, OH 45239 (US). THOMAS, Dennis, Albert; 11634 Mountholly Court, Cincinnati, OH 45240 (US).			
(74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217 (US).		(88) Date of publication of the international search report: 9 November 1995 (09.11.95)	

## (54) Title: ABSORBENT ARTICLE HAVING AN IMPROVED MECHANICAL FASTENING SYSTEM

## (57) Abstract

An absorbent article (20) having an improved fastening system. The fastening system includes a securement member (50) disposed in the rear waist portion of the absorbent article (10) and at least one landing member (40) disposed in the front waist portion of the absorbent article (20). The securement member (50) preferably includes a plurality of hooks (52). The landing member (40) preferably includes a plurality of loops which are engageable with the hooks (52) of the securement member (50). The landing member (40) is secured about its periphery along peripheral seal lines to the backsheet (26) in the front waist portion of the absorbent article (20). Upon separation of the securement member (50) from the landing member (40), the portion of the landing member (40) within the peripheral seal lines lifts and separates from the backsheet, (26) thereby increasing the peel strength of the fastening system.



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# INTERNATIONAL SEARCH REPORT

Inter- national Application No  
PCT/US 95/03077

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61F13/62

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP,A,0 496 567 (STANDARD TEXTILE COMPANY, INC.) 29 July 1992	1,5
Y	see page 14, line 25 - page 15, line 8  see page 16, line 5 - line 24 ---	2,3,7,9, 10
Y	EP,A,0 491 347 (KIMBERLY-CLARK CORPORATION) 24 June 1992 see column 3, line 51 - column 4, line 33 see column 4, line 54 - column 6, line 7 see claims 1-13 see figures 1-4 ---	2,3,7-10
Y	WO,A,93 19713 (THE PROCTOR AND GAMBLE COMPANY) 14 October 1993 see page 24, line 29 - page 25, line 21 --- -/--	7,8

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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